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Attorney File Ref: 102792-158/10563P3

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of:	Mark Timothy BENNETT et al
Serial No.:	10/645,248
Filed:	August 20, 2003
Examiner:	To Be Assigned
Art Group:	To Be Assigned
Title	METHOD AND COMPOSITION FOR DISINFECTING HARD SURFACES

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Transmittal of Priority Document

The applicant submits a certified copy of GB 0104153.2 filed in the UK Patent Office on 20 February 2001. Entry into the file wrapper is solicited.

Respectfully submitted;

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Enclosures – as indicated

Date: 25 June 2004

CERTIFICATE OF MAILING

I hereby certify that the foregoing Transmittal of Priority Document is being deposited with the United States Postal Service as express mail certificate # EV 424017939 US Mail in an envelope addressed to: Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313 on the date indicated below:

Date: June 25, 2004

By Kimberly Brittingham

Kimberly Brittingham

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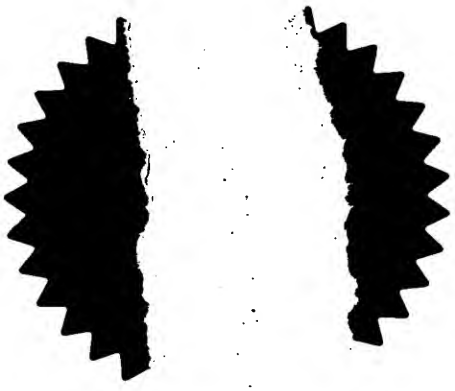

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Request for grant of a patent

(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)

1. Your reference — 10563P3 GB/AK

2. Patent application number *(The Patent Office will fill in this part)* — **0104153.2** — 20 FEB 2001

3. Full name, address and postcode of the or of each applicant *(underline all surnames)*

Reckitt Benckiser Inc
1655 Valley Road
Wayne
New Jersey 07474
UNITED STATES OF AMERICA

Patents ADP number *(if you know it)* 78522470001

If the applicant is a corporate body, give the country/state of its incorporation — DELAWARE

4. Title of the invention — Improvements in or relating to organic compositions

5. Name of your agent *(if you have one)* — Elizabeth A. Dickson

"Address for service" in the United Kingdom to which all correspondence should be sent *(including the postcode)*

Reckitt Benckiser plc
Group Patents Department
Dansom Lane
HULL
HU8 7DS
UNITED KINGDOM

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Country	Priority application number *(if you know it)*	Date of filing *(day / month / year)*

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Number of earlier application	Date of filing *(day / month / year)*

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? *(Answer 'Yes' if:*
a) any applicant named in part 3 is not an inventor, or
b) there is an inventor who is not named as an applicant, or
c) any named applicant is a corporate body.
See note (d)) — Yes

IMPROVEMENTS IN OR RELATING TO ORGANIC COMPOSITIONS

FIELD OF THE INVENTION

The present invention is directed to methods and compositions for the treatment of hard surfaces, including the disinfecting and/or sanitizing of such hard surfaces. The compositions of the invention can be used on hard non-porous surfaces.

BACKGROUND OF THE INVENTION

Microorganisms can usually be categorized into several general groups according to the innate resistance levels to a spectrum of physical or chemical germicidal agents (Manual of Clinical Microbiology, 5th edition, ed. A. Balows, ASM Press, Washington, D.C., p. 185 (1991). In order of decreasing resistance to germicidal agents the broad groups include: Bacterial spores > Mycobacteria (e.g. *Mycobacterium tuberculosis var. bovis*) > Nonlipid or small viruses (e.g. poliovirus, coxsackie virus), Fungi (e.g. *Trichophyton* sp., *Candida* sp.) > Vegetative bacteria (e.g. *Staphylococcus aureus*, *Salmonella cholerasuis*) > Lipid viruses (e.g. herpes simplex, HIV). From this scheme it can be presumed that activity against the more resistant organisms (e.g. *Mycobacterium tuberculosis var. bovis*, poliovirus) implies activity against the less resistant organisms (e.g. vegetative bacteria, lipid viruses).

It is generally known that ethanol can kill resistant organisms such as *Mycobacterium tuberculosis var. bovis* and poliovirus, but that high concentrations are needed (e.g. 70-90%). (*Disinfection, Sterilization, and Preservation*, Seymour S. Block, Lea & Febiger, Philadelphia, p. 197 (1991)) Prior studies have shown that ethanol, in concentrations of 63-70%, had little virucidal action against poliovirus. Other studies showed that a minimum concentration of 70% was required to inactivate this virus. This poses an environmental problem. There is substantial interest on the part of

governmental regulators to reduce VOC (volatile organic compounds). For example, at one time, the California Air Resource Board suggested that the VOC for disinfectant spray compositions be less than 60 weight percent.

In United States Patent 5,180,749, there is disclosed an antimicrobial composition that includes up to only about 30 percent by weight ethanol. This compositions also includes however, another active ingredient which is also a VOC, benzyl alcohol. Other references also show the use of relatively low (e.g. about 50% by weight ethanol) but these compositions also include other active components, typically VOC. These other active components often are undesirable for a number of reasons, one of which is cost as well as a lack of efficacy against highly resistant organisms (e.g. poliovirus).

Thus, there is a continuing need for low VOC disinfecting methods and compositions.

SUMMARY OF THE INVENTION

In accordance with the present invention, there is disclosed a method for disinfecting and/or sanitizing a hard surface comprising the step of treating said surface with an aqueous solution comprising an alcohol selected from the group consisting of methanol, ethanol, n-propanol, isopropanol, n-butanol, benzyl alcohol, and mixtures thereof which is present in an amount of from about 40 and 70 weight percent; an effective amount of a pH modifying agent such that the pH range of the composition is from about 9.5 to about 11; optionally, a component selected from the group consisting of antimicrobials, corrosion inhibitors, perfumes, perfume carriers, solvents, surfactants, propellants, pH buffers, fungicides, film-forming polymers, and anti-oxidants; and water, to 100 weight percent.

In certain preferred embodiments, the compositions used in the method also include tetrasodium ethylenediaminetetraacetate (Na_4EDTA) as a pH modifier. In other preferred embodiments, the alcohol is preferably ethanol

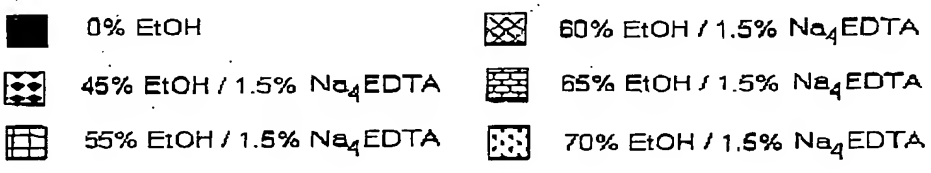
which is present in an amount of from about 50 to about 60 weight percent. Preferably, the composition is in an aerosol form.

Also in accordance with the present invention, there is disclosed a composition for sanitizing and/or disinfecting a hard surface comprising an alcohol selected from the group consisting of methanol, ethanol, n-propanol, isopropanol, n-butanol, benzyl alcohol, and mixtures thereof which is present in an amount of from about 40 to about 70 weight percent; an effective amount of a pH modifying agent such that the pH range of the composition is from about 7.0 to about 11.5; optionally, a component selected from the group consisting of antimicrobials, corrosion inhibitors, perfumes, perfume carriers, solvents, surfactants, propellants, pH buffers, fungicides, film-forming polymers, and anti-oxidants; and water, to 100 weight percent.

In certain preferred embodiments, the compositions include Na_4EDTA. In other preferred embodiments, the alcohol is preferably ethanol which is present in an amount of from about 50 to about 60 weight percent. Preferably, the composition is in an aerosol form.

BRIEF DESCRIPTION OF THE DRAWING

Figure 1 shows the efficacy of different formulations of ethanol and Na_4EDTA (1.5% Na_4EDTA solution is 0.56% EDTA adjusted to pH with sodium citrate) at various pH levels against poliovirus type 1. The legend for Figure 1 is as follows:



DETAILED DESCRIPTION OF THE INVENTION

In accordance with the present invention, there is disclosed a method for sanitizing and/or disinfecting a hard a surface comprising the step of treating said surface with an aqueous solution comprising an alcohol selected from the group consisting of methanol, ethanol, n-propanol, isopropanol, n-butanol, benzyl alcohol, and mixtures thereof which is present in an amount of from about 40 and 70 weight percent; an effective amount of a pH modifying agent such that the pH range of the composition is from about 9.5 to about 11; optionally, a component selected from the group consisting of antimicrobials, corrosion inhibitors, perfumes, perfume carriers, solvents, surfactants, propellants, pH buffers, fungicides, film-forming polymers, and anti-oxidants; and water, to 100 weight percent.

In certain preferred embodiments, the compositions used in the method also include Na_4EDTA as a pH modifier. In other preferred embodiments, the alcohol is preferably ethanol which is present in an amount of from about 50 to about 60 weight percent. Preferably, the composition is in an aerosol form.

Also in accordance with the present invention, there is disclosed a composition for sanitizing and/or disinfecting a hard surface comprising an alcohol selected from the group consisting of methanol, ethanol, n-propanol, isopropanol, n-butanol, benzyl alcohol, and mixtures thereof which is present in an amount of from about 40 to about 70 weight percent; an effective amount of a pH modifying agent such that the pH range of the composition is from about 7.0 to about 11.5; optionally, a component selected from the group consisting of antimicrobials, corrosion inhibitors, perfumes, perfume carriers, solvents, surfactants, propellants, pH buffers, fungicides, film-forming polymers, and anti-oxidants; and water, to 100 weight percent.

In certain preferred embodiments, the compositions include Na_4EDTA. In other preferred embodiments, the alcohol is preferably ethanol which is present in an amount of from about 50 to about 60 weight percent. Preferably, the composition is in an aerosol form.

In accordance with the present invention, the alcohol containing aqueous composition has a pH in the range of from about 7.0 to about 11.5. The pH can be adjusted to the desired level using one or more suitable bases. In this regard, the inventors have found an inverse relationship between the alcohol level and the pH. The pH at which the formulations are effective depends on the alcohol level. The inventors have found that, for example, a 45% ethanol formulation is effective against poliovirus at a pH of 11.5 or greater. Similar efficacy is found with a 65% ethanol formulation at a pH of about 7.0.

Useful bases include, for example, alkali metal hydroxides such as lithium, sodium, potassium and calcium hydroxide; ammonium hydroxide; Na_4EDTA; tri- or tetraammonium ethylenediaminetetraacetate (ammonium EDTA); and tri- or tetrapotassium ethylenediaminetetraacetate (potassium EDTA). Alkali metal or hydrogen carbonates such as sodium carbonate or sodium hydrogen carbonate and alkali metal salts of borates or phosphates can also be used either alone, mixtures thereof, or in conjunction with the aforementioned bases.

As noted, it is preferred that the compositions contain significant amounts of Na_4EDTA to adjust the pH although other compounds can also contribute to the pH adjustment. As used in the present invention, amounts from about 0.1 to about 2.0 are useful. Na_4EDTA is commercially available under the tradenames Versene® 100LN from Dow Chemical and Dissolvine® E-39 from Akzo Nobel. Other salts of EDTA, such as tri- or tetrapotassium EDTA or tri- or tetraammonium EDTA, as well as mixtures thereof, can also be used to adjust the pH of the compositions. Tri- or tetrapotassium EDTA or tri- or tetraammonium EDTA are also available under the Dissolvine® tradename.

As will be seen in the comparative examples which follow, it is surprising that the alcohol containing compositions having a pH range from

about 7.0 to about 11.5 provide such effectiveness against poliovirus and other difficult pathogens since high pH solution alone do not provide this effect.

The alcohol used in the inventive compositions is generally present in an amount of from about 45 to about 70 weight percent of the composition, preferably from about 55 to about 60 weight percent. The alcohol used in the inventive compositions can be methanol, ethanol, n-propanol, isopropanol, n-butanol, benzyl alcohol, or mixtures thereof.

The major component of the compositions used in the invention is water, the concentration of which, based on the total weight of the three essential ingredients, ranges from about 30 to about 55 weight percent.

One or more other ingredients may optionally be included in the compositions in order to provide aesthetic or other beneficial properties thereto. Such optional ingredients are, for example, additional antimicrobial agents, deodorizers, emulsifiers, solubilizers, corrosion inhibitors when the compositions are packaged in metal containers, e.g., aerosol containers, perfumes, perfume carriers, surfactants, propellants, pH buffers, fungicides, film-forming polymers, and anti-oxidants and solvents, the only requirement being that for any particular composition such optional ingredients be compatible with the other ingredients present therein.

By way of example, optional ingredients which may be incorporated include the following:

Antimicrobials (also known as antibacterials) - phenolic compounds such as o-phenylphenol, o-benzyl-p-chlorophenol and 4-tertamylphenol; and quaternary ammonium compounds such as alkyl dimethyl benzyl ammonium chloride, octyl decyl dimethyl ammonium chloride, dioctyl dimethyl ammonium chloride, didecyl dimethyl ammonium chloride and alkyl dimethyl benzyl ammonium saccharinate. Other useful antibacterial agents include those

described in United States patent numbers 3,835,057 and 4,714,563. Particular antibacterials that are useful include:

2, 6-dimethyl-4-hydroxychlorobenzene; 3,4,4'-trichlorocarbanilide; 3-trifluoromethyl-4,4'-dichlorocarbanilide; 2, 2'-dihydroxy-3,3',5,5',6,6'-hexachlorodiphenylmethane; 2, 2'-dihydroxy-3,3',5,5'-tetrachlorodiphenylmethane; 2, 2'-dihydroxy-3, 3'-dibromo-5,5'-dichlorodiphenylmethane; 2-hydroxy-4,4'-dichlorodiphenylether; 2-hydroxy-3,5',4-tribromodiphenylether; and 1-hydroxy-4-methyl-6-(2.4.4-trimethylpentyl)-2(1H)pyridinone. Other antibacterials are available under the BARDAC®, BARQUAT®, HYAMINE®, LONZABAC®, BTC®, and ONYXIDE® trademarks, which are more fully described in, for example, *McCutcheon's Functional Materials* (Vol. 2), North American Edition, 2000, and the respective product literature from the respective suppliers - Lonza (BARDAC, BARQUAT, HYAMINE, LONZABAC) and Stepan Chemical (BTC and ONYXIDE).

A preferred antibacterial agent is Onyxide® 3300. This is a non-chloride ion containing quaternary ammonium antimicrobial that is less corrosive than typical halogen based quaternary ammonium compounds. When added to the inventive compositions, the additional antimicrobial agent is generally present in an amount of from about 0.01 to about 0.10 weight percent of the composition, preferably from about 0.05 to about 0.075 weight percent.

Deodorizer - N-alkyl-N-ethylmorpolinium ethyl sulfate.

Corrosion Inhibitor - mono - and triethanolamine, ammonium hydroxide, sodium molybdate and sodium benzoate. The corrosion inhibitor is generally present in an amount of from about 0.02 to about 0.50 weight percent of the composition, preferably from about 0.05 to about 0.10 weight percent.

Solvent - alcohols such as isopropyl alcohol and butyl alcohol; glycols such as propylene glycol triethylene glycol and the like; each of which can also contribute to antimicrobial activity. The glycols are particularly useful in air sanitizer embodiments.

Where guidance is not given above, the amount of the optional components can readily be determined by one skilled in the art.

The compositions used in the invention can contain small amounts of surfactant to improve surface wetting and to improve evenness of contact. These surfactants when used for this purpose are present in low amounts, for example, up to about 0.5 percent by weight.

Examples of surfactants include:

(1) alkyl sulfonates and sulfates wherein the alkyl is straight or branched and has from about 8 to about 24 carbon atoms and the cation is water-soluble, e.g., alkali metal and ammonium;

(2 (preferred)) fluorinated surfactants such as, for example, anionic, nonionic, cationic and amphoteric fluorosurfactants marketed by E. I. Dupont de Nemours and Company under the trademark ZONYL® e. g. ZONYL® FSK, an amphoteric fluorosurfactant, ZONYL® FSN and ZONYL® FSO, fluorosurfactants, ZONYL® FSJ, an anionic fluorosurfactant and ZONYL®FSC and ZONYL® FSD, cationic fluorosurfactants; as well as fluorosurfactants marketed by The 3M Corporation under the FLUORAD® mark such as Fluorad® FC-171 (a nonionic fluorosurfactant), Fluorad® FC-135 (a cationic surfactant), Fluorad® FC-740 (generally described to be fluorinated alkyl esters), Fluorad® FC-430 (generally described to be fluorinated alkyl esters), Fluorad® FC-431 (generally described to be fluorinated alkyl esters), and, Fluorad® FC-170-C (generally described as being fluorinated alkyl polyoxyethylene ethanols);

(3) alkali metal salts of alkylbenzene and alkyl toluene sulfonic acids where alkyl has from about 9 to about 15 carbon atoms;

(4) alkali metal and amine, e.g. an ethanolamine, salts of mono- and di-alkyl esters of sulfosuccinic acid where alkyl can be straight or branched and has from 7 to 30 carbon atoms;

(5) alkali metal or ammonium salts of the reaction product of C8 to C22 alcohols and ethylene oxide. Specific useful surfactants include those described in WO 92/18100, namely ammonium laureth sulfate; parenth-15-7 carboxylic acid; TEA-oleamido PEG-n sulfosuccinate; and PPG-5-ceteth-10 phosphate;

(6) lauryl sulfates; oleyl succinates; lauryl ether sulfates; dodecylbenzene sulfonates; and N-lauroyl sarcosinate. The usual counter ion is sodium, ammonium or ethanolamines such as mono and triethanolamine;

(7) aminocarboxylic and aminosulfonic acids and salts thereof such as alkali metal 3-(dodecylamino) propionate and alkali metal 3-(dodecylamino) propane-1-sulfonate; and alkyl and alkylamido betaines such as cocamidopropyl betaine;

(8) C_{12}-C_{15} linear primary alcohol ethoxylates [more preferably, a C_{12-15} linear primary ethoxylate have 7 moles EO (ethylene oxide) per mole of alcohol, as commercially available under the trademark NEODOL™ 25-7 supplied by Shell Chemical Company, Houston, Texas]

The compositions of the invention may be formulated with conventional propellants for dispensing as aerosols from conventional pressurized containers. Propellants which may be used are well known and conventional in the art and include, for example, a hydrocarbon, of from 1 to 10 carbon atoms, such as n-propane, n-butane, isobutane, n-pentane, isopentane, and mixtures thereof; dimethyl ether and blends thereof as well as individual or mixtures of

chlorofluoro- and/or fluorohydrocarbons- and/or hydrochlorofluorocarbons (HCFCs). Useful commercially available compositions include A-70 (Aerosol compositions with a vapor pressure of 70 psig available from companies such as Diversified and Aeropress.) Compressed gases such as carbon dioxide, compressed air, nitrogen, and possibly dense or supercritical fluids may also be used.

The amount of propellant employed should provide a suitable spray pattern and for essentially complete expulsion of the composition from the aerosol container. The appropriate amount to be used for any particular aerosol propellant system can readily be determined by one skilled in the art. Preferably, the propellants comprise about 1% to about 50% of the aerosol formulation with preferred amounts being from about 2% to about 25%, more preferably from about 5% to about 15%. Generally speaking, the amount of a particular propellant employed should provide an internal pressure of from about 20 to about 150 psig at 70 F.

The compositions can be packaged in conventional, ready-to-use dispensing systems. Thus they can be packaged in aerosol form in conventional aerosol containers or in liquid form in trigger pumps spray bottles and squeeze bottles. They can also be impregnated into towelettes and packaged individually or packaged in bulk form for individual dispensing. The types of trigger pump spray bottles, squeeze bottles, and towlettes are well know to those of ordinary skill in the art.

The compositions can be prepared by entirely conventional procedures, no special techniques being required.

The following examples are presented for a further understanding of the invention. The data shown in Tables 1 through 4 show various embodiments of the present invention. Table 1 shows poliovirus inactivation at various levels of alcohol and pH; Table 2 shows poliovirus inactivation at zero level alcohol at various pH; Tables 3A, 3B, and 3C show poliovirus

inactivation at various alcohol levels at pH 7.0, 8.0, and 10.0, respectively; and Table 4 shows disinfection activity at various alcohol levels and pH.

Table 1	Ex.1	Ex.2	Ex.3	Ex.4	Ex.5	Ex.6	Ex.7	Ex.8
Ethyl alcohol	45.00	45.00	45.00	45.00	45.00	55.00	55.00	55.00
Na_4EDTA (38%)	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
Citric acid (50%)	0.11	0.08	0.06	0.04	0.03	0.35	0.24	0.20
Deionized water	q.s.	q.s.	q.s.	q.s.	q.s.	q.s.	q.s.	q.s.
pH	9.5	10.0	10.5	11.0	11.5	7.0	8.0	8.5
Poliovirus log reduction	0.00	1.00	1.00	1.00	3.00	0.88	0.50	2.88

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Table 1 (cont'd)	Ex.9	Ex.10	Ex.11	Ex.12	Ex.13	Ex.14	Ex.15	Ex.16
Ethyl alcohol	55.00	55.00	55.00	60.00	60.00	65.00	65.00	70.00
Na_4EDTA (38%)	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
Citric acid (50%)	0.15	0.10	0.08	0.22	0.29	0.24	0.37	0.39
Deionized water	q.s.	q.s.		q.s.	q.s.	q.s.	q.s.	q.s.
pH	9.0	9.5	10.0	7.5	8.0	7.0	8.0	7.0
Poliovirus log reduction	4.50	4.17	4.88	1.33	2.00	2.33	2.67	4.67

Table 2	Ex.17	Ex.18	Ex.19
Ethyl alcohol	--	--	--
Na_4EDTA (38%)	1.50	1.50	1.50
Citric acid (50%)	0.29	0.24	--
Deionized water	q.s.	q.s.	q.s.
pH	7.0	10.0	11.5
Poliovirus log reduction	0.00	0.00	0.05

Table 3A	Ex.20	Ex.21	Ex.22	Ex.23
Ethyl alcohol	--	55.00	65.00	70.00
Na_4EDTA (38%)	1.50	1.50	1.50	1.50
Citric acid (50%)	0.29	0.35	0.24	0.39
Deionized water	q.s.	q.s.	q.s.	q.s.
pH	7.0	7.0	7.0	7.0
Poliovirus log reduction	0.00	0.88	2.33	4.67

Table 3B	Ex.24	Ex.25	Ex.26
Ethyl alcohol	55.00	60.00	65.00
Na_4EDTA (38%)	1.50	1.50	1.50
Citric acid (50%)	0.24	0.29	0.37
Deionized water	q.s.	q.s.	q.s.
pH	8.0	8.0	8.0
Poliovirus log reduction	0.50	2.00	2.67

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Table 3C	Ex.27	Ex.28	Ex.29
Ethyl alcohol	--	45.00	55.00
Na_4EDTA (38%)	1.50	1.50	1.50
Citric acid (50%)	0.14	0.08	0.08
Deionized water	q.s.	q.s.	q.s.
pH	10.0	10.0	10.0
Poliovirus log reduction	0.00	1.00	4.88

Table 4	Ex.30	Ex.31	Ex.32	Ex.33
Ethyl alcohol	60.000	60.000	56.500	55.000
Onyxide® 3300		0.100	0.050	0.50
Corrosion Inhibitor	0.099	0.099	0.097	0.100
Na_4EDTA (38%)	1.482	1.482	1.488	1.900
Fragrance	0.225	0.225	--	--
Ammonium hydroxide (28%)	0.247	0.247	0.193	0.190
Propellant	1.200	1.200	3.500	5.000
Deionized water	q.s.	q.s.	q.s.	q.s.
pH	10.4	10.6	10.2	10.8
Poliovirus log reduction	4.00	N.E.	N.E.	5.50
Staphylococcus aureus survival	0/60*	0/20*	N.E.	N.E.
Psuedomonas aeruginosa survival	0/60*	0/20*	N.E.	N.E.
M. smegmatis survival	0/15*	N.E.	N.E.	N.E.
Salmonella cholerasuis	N.E.	0/20*	N.E.	N.E.
Mycobacterium terrae	N.E.	N.E.	0/20*	0/20*

* number of positive plates/number of tested plates
N.E. not evaluated

The method for determining the efficacy of various formulations against poliovirus was as follows:

Poliovirus type 1 (Sabin) virus stocks were propagated in FRhK-4 cells and generally contained approximately $\log_{10}7.5$ $TCID_{50}$ per 0.2 ml. For testing, 0.2 ml of virus stock (containing 10% Fetal Bovine Serum (FBS)) was added to 1.8 ml of the formulation tested and allowed to remain at ambient temperature (approximately 20-26 C) for 10 minutes. After the contact time, serial tenfold dilutions of virus were carried out in maintenance medium (Earle's Minimal Essential Medium (EMEM) + 2% FBS). Growth media was removed from the wells of 24 well assay plates containing confluent

monolayers of FRhK-4 cells and replaced with 2 ml of maintenance medium (EMEM + 2% FBS). A 0.2 ml aliquot of each dilution of virus/test formulation was then place into each of four separate wells of host cells. The assay plates were incubated at 37 C for 7 to 10 days, with media changes every 2 to 4 days. Virus controls were carried out in an identical manner using 1.8 ml of EMEM, in place of the test formulation. Cytotoxicity controls were carried out by utilizing 0.2 ml of EMEM + 10% FBS in place of the virus stock. Plates were scored for characteristic viral cytopathic effect (cellular rounding and degeneration) and $TCID_{50}$ endpoint titers were determined.

The method for determining the efficacy of various formulations against the bacteria mentioned above was based on the standard AOAC Germicidal Spray Products test or AOAC Tuberculocidal Activity of Disinfectant Spray Products Test. A representative film of target bacteria was dried on a hard, non-porous surface (e.g., glass slide). The treated slides were then treated with the test formulations for a contact time of ten minutes. After exposure, the treated slides were transferred to vessels containing neutralizing media and assayed for survivors. Appropriate viability, dried organism population and neutralization controls were conducted.

The invention has been described in detail with particular reference to preferred embodiments thereof, but it will be understood that variations and modifications can be effected within the spirit and scope of the invention.

CLAIMS

1. A composition for sanitizing and/or disinfecting a hard surface comprising

an alcohol selected from the group consisting of methanol, ethanol, n-propanol, isopropanol, n-butanol, benzyl alcohol, and mixtures thereof which is present in an amount of from about 40 to about 70 weight percent;

an effective amount of a pH modifying agent such that the pH range of the composition is from about 7.0 to about 11.5;

optionally, a component selected from the group consisting of antimicrobials, corrosion inhibitors, perfumes, perfume carriers, solvents, surfactants, propellants, pH buffers, fungicides, film-forming polymers, and anti-oxidants; and

water, to 100 weight percent.

2. The composition according to claim 1 wherein the alcohol is ethanol.

3. The composition according to claim 2 wherein the amount of ethanol is from about 50 to about 60 weight percent.

4. The composition according to claim 3 wherein the pH of the composition is from about 9 to about 10.5.

5. The composition according to claim 4 which contains a propellant.

6. A method for inactivating viruses and microorganisms on a hard surface comprising the step of treating said surface with a composition comprising an alcohol selected from the group consisting of methanol, ethanol, n-propanol, isopropanol, n-butanol, benzyl alcohol, and mixtures thereof which is present in an amount of from about 40 to about 70 weight percent; an effective amount of a pH modifying agent such that the pH range of the composition is from about 7.0 to about 11.5; optionally, a component

selected from the group consisting of antimicrobials, corrosion inhibitors, perfumes, perfume carriers, solvents, surfactants, propellants, pH buffers, fungicides, film-forming polymers, and anti-oxidants; and water, to 100 weight percent.

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ABSTRACT

IMPROVEMENTS IN OR RELATING TO ORGANIC COMPOSITIONS

There is disclosed an aqueous solution of alcohol having a weight percent of alcohol of from about 40 to about 70 with the solution have a pH of from about 7.0 to about 11.5 for the treatment of non-porous hard surfaces as well as a method for inactivating viruses and microorganisms on a non-porous hard surface comprising the step of treating said surface with an aqueous solution of alcohol having a weight percent of alcohol of from about 40 to about 70 with the solution have a pH of from about 7.0 to about 11.5.

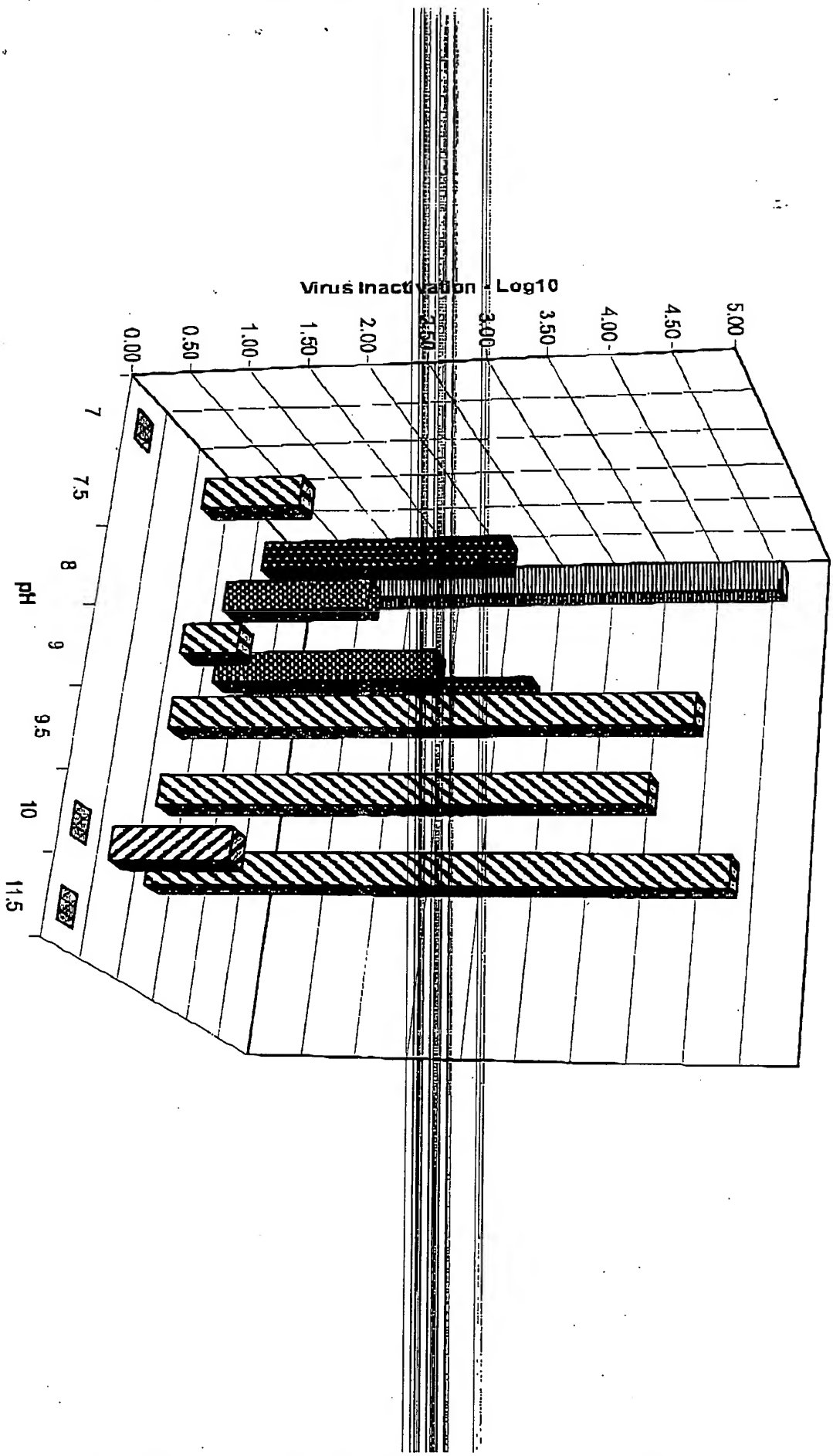
Virus Inactivation - Log10
0.00
0.50
1.00
1.50
2.00
2.50
3.00
3.50
4.00
4.50
5.00
pH
7
7.5
8
9
9.5
10
11.5

Figure 1